

Salty diet reduces tumor growth by tackling immune cells

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A study by an international research team led by Professor Markus Kleinewietfeld (VIB-UHasselt) shows that high salt intake inhibits tumor growth in mice. The effect seems to be due to a change in function of

certain immune cells which play a critical role in cancer immunity. The further exploration of this finding might be beneficial for improving anti-cancer immunotherapies.

Salt impacts experimental tumor models

High salt intake is a known risk factor for high blood pressure and cardiovascular diseases. Recent research has also indicated that too much salt may impact autoimmunity. Studies have shown that a high salt diet could change the immune cell balance towards a more aggressive state and worsen autoimmunity. Interestingly, these shifts in the immune cell balance, though detrimental in autoimmune conditions, could be in theory useful in anti-cancer immune therapies to improve immune attacks against tumor cells.

An international research team led by Prof. Kleinewietfeld that included Prof. Sven Brandau (University of Duisburg-Essen, Germany), Dr. Thomas Kammertöns (Charite & MDC-Berlin, Germany) and Prof. Jo Van Ginderachter (VIB-VUB) have now investigated the impact of high salt intake on tumor growth in mice. They found that a high salt diet inhibited tumor growth in two independent mouse models. The research team further found that this effect seemed to be related to a change in the functions of certain immune cells, so called [myeloid-derived suppressor cells](#) (MDSCs). MDSCs are believed to hinder other immune cells to efficiently attack and eliminate tumor cells.

Immune cells changing function

When the researchers mimicked a salty environment in cell culture, they observed a functional change in MDSCs. The cells were less capable to inhibit other immune cells. A similar modulatory effect of high salt conditions on MDSCs was observed with cells isolated from human

cancer patients. Moreover, if these cells were depleted, the effect of a high salt diet on tumor growth in mice was undone.

MDSCs are suspected to be an important mechanism that prevents an efficient immune attack against tumors in anti-cancer immunotherapies. The underlying molecular mechanism that blocks the function of these [cells](#) could therefore have therapeutic potential. However, since high salt intake is suspected to be a risk factor for [gastric cancer](#) in humans, the findings of this study and [molecular mechanisms](#) behind them must be carefully analyzed in future studies.

Prof. Kleinewietfeld (VIB-UHasselt): "The findings are highly interesting, and we were surprised to see such an effect on [tumor](#) growth just by increasing the [salt](#) in the diet. However, [future studies](#) are needed to fully understand the effect and the detailed underlying molecular mechanisms behind to judge its therapeutic potential for anti-cancer immunotherapies.

More information: Ralf Willebrand et al, High Salt Inhibits Tumor Growth by Enhancing Anti-tumor Immunity, *Frontiers in Immunology* (2019). [DOI: 10.3389/fimmu.2019.01141](https://doi.org/10.3389/fimmu.2019.01141)

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